

Claims

1-15 Canceled

16. (New) An electrohydraulic brake system for a motor vehicle which can be operated in a 'brake-by-wire' mode of operation both by an operator and independently of the operator, the brake system comprising:

a master cylinder (1) connectable to wheel brake cylinders;

a first piston (2) coupled to a brake pedal (3);

a second piston (4) for actuating the master cylinder (1);

a third piston (5) which can be operated by the first piston (2);

at least one brake pedal characteristics simulation device (6, 7) provided between the first (2) and the third piston (5) for imparting a comfortable pedal feel to the operator in a 'brake-by-wire' mode of operation;

a hydraulic chamber (21) cooperating with the brake pedal characteristics simulation device (6, 7) being limited between the first (2) and the third piston (5), wherein all three pistons (2, 4, 5) and the brake pedal characteristics simulation device (6, 7) are arranged in a housing (8);

a hydraulic pressure source (9) operable by an electronic control and regulation unit;

a valve device (10) operable by the third piston (5) for reducing the pressure of the pressure source (9) to a value used for application of the second piston (4), wherein the second (4) and the third piston (5) are isolated from each other by a space (11) so that the third piston (5) is acted upon by the pressure that acts on the second piston (4) in a direction opposite to a direction of application of the second piston (4); and

AP 10738

a device (29 – 31, 45) which by way of a variation of the pressure fluid volume in the hydraulic chamber (21) controlled by electromagnetic valve, allows a pedal performance that differs from a brake pedal characteristics that is predefined by the brake pedal characteristics simulation device.

17. (New) A brake system according to claim 16, wherein the device (29 - 31) is electrically controllable by the electric control and regulation unit.
18. (New) A brake system according to claim 17, wherein the device is formed of an electromagnetically operable two-way/two-position directional control valve (29) inserted into a first connection (40) between the hydraulic chamber (21) and an unpressurized pressure fluid supply reservoir (22), a second electromagnetically operable two-way/two-position directional control valve (30) inserted into a second connection (42) between the hydraulic chamber (21) and the unpressurized pressure fluid supply reservoir (22), as well as a third electromagnetically operable two-way/two-position directional control valve (31) inserted into a conduit (43) leading to the pressure source (9 or 19).
19. (New) A brake system according to claim 18, wherein a pressure sensor (32) is provided to determine the pressure prevailing in the hydraulic chamber (21).
20. (New) A brake system according to claim 18, wherein the first two-way/two-position directional control valve (29) is configured as a normally open (NO) valve, while the second two-way/two-position directional control valve (30) is configured as a normally closed (NC) valve.
21. (New) A brake system according to claim 18, wherein the third two-way/two-position directional control valve (31) is configured as a normally closed (NC) valve which closes the hydraulic conduit (43) in its first switch position and fulfils the function of a non-return valve closing towards the pressure source (9, or 19) in its

second switch position.

22. (New) A brake system according to claim 16, wherein a sensor (39) is provided to monitor a charging condition of the high-pressure accumulator (19), whose output signal is sent to the electronic control unit and which is integrated in the housing (8) or form-lockingly connected to the housing.
23. (New) A brake system according to claim 16, wherein a pressure sensor (18) is provided to sense the pressure that prevails in the space (11), whose output signal is sent to the electronic control unit and which is integrated in the housing (8) or form-lockingly connected to the housing.
24. (New) A brake system according to claim 16, wherein an electrohydraulic control or regulation unit (28) of an anti-lock system (ABS) is connected to the master brake cylinder (1).
25. (New) A brake system according to claim 16, wherein the brake pedal characteristics simulation device comprises at least one elastic element (6, 7) which exerts a 'spring force' component of the force generated by the brake pedal characteristics simulation device which depends on the relative travel between first (2) and third piston (5).
26. (New) A brake system according to claim 25, wherein the brake pedal characteristics simulation device comprises at least one damping device which exerts a 'damping force' component of the force generated by the brake pedal characteristics simulation device that depends on the relative speed between the first (2) and the third piston (5).
27. (New) A brake system according to claim 25, wherein the brake pedal characteristics simulation device (6, 7) comprises at least one of the components

AP 10738

steel spring, elastomeric body, and frictional connection exerting the force generated by the brake pedal characteristics simulation device.

28. (New) A brake system according to claim 27, wherein each of the components exerting the force generated by the brake pedal characteristics simulation device are arranged either outside ('dry') or inside ('wet') the hydraulic chamber (21).
29. (New) A brake system according to claim 16, wherein the pedal performance differing from the predetermined brake pedal characteristics includes electronically controlled pedal vibrations.
30. (New) A brake system according to claim 16, wherein the pedal performance differing from the predetermined brake pedal characteristics includes an electronically controlled temporary push back of the brake pedal.